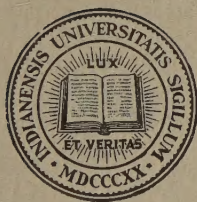


A SEMANTIC ANALYSIS OF TIME WITH A SEMANTIC
ALPHABET OF THE COMMONEST ENGLISH WORDS

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Published under the Auspices
of the
GRADUATE SCHOOL, INDIANA UNIVERSITY

1936

Bloomington Ind

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*An abstract of a thesis
submitted to the faculty of the Graduate School
in partial fulfillment of the requirements
for the degree, Doctor of Philosophy,
in the Department of English,
Indiana University*

* 38194

PREFACE

This abstract summarizes my doctoral dissertation, as revised after approval by my committee and publication in typewritten form (June, 1933).

The 1933 form profited greatly by the wise counsels of Professors Guido H. Stempel and J. R. Kantor of Indiana University, who patiently watched and directed its development. It profited also by certain information from Professor Harold T. Davis, and by the criticism and approval of Professors H. H. Carter, Stith Thompson, and J. H. Pitman. To Professor Edward Sapir of Yale University are due both the subject of the dissertation, and a comment that has led to my statistical determination of a new semantic alphabet of undefined terms for analyzing *time*.

My revision and abstract have been decidedly improved by a number of suggestions from Professor D. S. Robinson of Indiana University and from my wife, as well as by my teaching the preparation of research papers for three years in two universities. Since the completion of the abstract, Professor C. C. Fries of the University of Michigan has brought to my attention "The Technique of Semantics" (*Transactions of the Philological Society*, 1935) by Mr. J. R. Firth, whose choice of terminology has in general confirmed my own. A few points, however, have been rephrased to meet criticism from Professors E. H. Sturtevant of Yale University, Hayward Keniston of the University of Chicago, and C. L. Meader of the University of Michigan.



SUMMARY

I. SEMANTIC ALPHABETS

Semantic analyses—explanations of the meanings of words—are doubly linguistic: (1) they are analyses of words; (2) they are written in words. The words in which semantic analyses are written may be compared with the letters in which phonetic analyses are often written; but whereas linguists have systematized the letters used in phonetic analyses into phonetic alphabets, they have not similarly systematized the words used in semantic analyses into “semantic alphabets.” Consequently, semantic analyses are often written in words which are not only more difficult to understand than the words analyzed, but which would even need to be explained by the words analyzed.

Rhetoricians and logicians warn against writing semantic analyses in words which need to be explained by the words analyzed; such analyses they would call circular definitions. Yet it is easy to see that a dictionary which attempts to define all words must contain circular definitions in the first degree or higher degrees.¹ One can, in fact, be sure of avoiding circularity only by the procedure used in symbolic logic: announce a restricted list of undefined terms, and make all definitions in these. Any such list is a tentative semantic alphabet.

If only the commonest words are used as terms of a semantic alphabet, definitions entirely in these terms will be

¹ A good example, showing several degrees of circularity, is the definition of *time* as “system of reckoning the lapse or progress of time.” This is part of definition 15 in the 1934 Webster, which has the most modern dictionary treatment of *time*. It is circular:

- (1) in the first degree because it includes *time* itself;
- (2) in the second degree because it includes *progress*, since *progress* is defined (in part of definition 1) as “movement forward as in time or space”;
- (3) in the third degree likewise because it includes *progress*, since another part of definition 1 of *progress* is “onward course,” and definition 9 of *course* includes *time* (“progress considered with regard to time”);
- (4) in perhaps higher degrees, which might be revealed by further investigation.

For another example of circularity, note that definition 1 of *progress*—at least the part quoted in (3)—is circular in the second degree: it includes *course*, and definition 9 of *course* includes *progress*.

not only noncircular, but also less difficult than the words defined. From the statistics on the occurrence of English words recorded in six standard word lists, three tentative semantic alphabets of common words may be derived:

(1) a **minimum**—the words (only two hundred) given by each of the six lists as being among the five hundred commonest words;

(2) a **medium**—the words (less than a thousand, including the minimum) given by two lists as being in the first five hundred, or by three lists as being in the first thousand;

(3) a **maximum**—the words (approximately twenty-five thousand) given by any of the six lists.

These three objectively determined semantic alphabets should be sufficient to explain any word not included in them, especially if supplemented by devices simulating direct representation: pictures, standard symbols, and capitalized words (such as proper names). Analysis of words that are included in these semantic alphabets (especially in the minimum) will, however, be more helpful in developing a single, completely standardized semantic alphabet—if only because it is by such analysis that the number of undefined terms is reduced. *Time* is especially fitted for analysis as being the commonest English noun, and as having been copiously defined by philosophers and physicists as well as lexicographers.

Since the tentative minimum semantic alphabet will supply most of the terms used in the analysis, it is given as a whole among the Supplements at the end of the abstract (in VII. The Commonest English Words), where also the lists on which it is based are cited more fully. Any words from the medium semantic alphabet that are needed in the analysis will be marked ^m wherever they are used; from the maximum, ^M.

II. THE DEFINITION OF TIME

Aristotle's definition of *chronos* can be translated by words from the minimum semantic alphabet: *number of change as before and after*. Does the translation have the same meaning as the English word *time*? It does if it could be substituted for *time* in some context of situation in which

time is used.² **Substitution in similar contexts might be called the test of the adequacy of any translation** (synonyms included); and an adequate translation might be called the objective (directly examinable) meaning of what is translated. So used, "adequacy" and "adequate" do not imply equivalence in all situations—merely in at least one.

In the verbal contexts of writing, such as the illustrative quotations on which NED definitions are based, words are more nearly independent units than in conversation. It is true that not one of the NED definitions of *time* looks like a translation of Aristotle. There are, however, six that correspond to Liddell-Scott definitions of *chronos*. Under each of these six NED definitions, the latest quotation is taken as context in a substitution test for the adequacy, as a semantic analysis of *time*, of the translation of Aristotle's definition.

The results of making this test are: (1) *Number of change as before and after* can be substituted completely for *time* and *times*^m in only one quotation, and partially in only two more. (2) The other contexts require other meanings, or retranslation—including omission and re-arrangement of other words than *time*—of the entire quotation. (3) Translation by words from the minimum semantic alphabet is always possible.

To these results, corollaries may be added: (a) There is probably no formula that can be called THE definition of *time*. (b) Translation (or substitute) is a better name than definition for an analysis that meets the substitution test. (c) A semantic alphabet is more helpful in analyzing a word than is a set of synonyms or dictionary definitions.

The most popular type of nonlexicographical semantic analysis has not been translation, but classification. Classification may be illustrated by a re-interpretation of Kant's modes of *Zeit*: *Beharrlichkeit* as *measure*^m of *event*^m; *Folge* and *Zugleichsein* as *order*^m of *events*^m (*events*^M). If the usual inexact assumption of identity between *chronos*, *Zeit*, *time*, etc., is made, these classifications correspond to parts of Aristotle's definition, and may be used to suggest questions

² Of course, no situation can be repeated, or be the same situation as another; the nearest approximation that can occur or be constructed is some very similar situation.

(written in the minimum semantic alphabet) under which to classify the contexts quoted from the NED. A better use would be to suggest either possible translations, whose adequacy can be objectively tested, or descriptions of context.

A rudimentary example of the descriptive type of analysis is the observation that all the situations behind the verbal contexts quoted from the NED have in them a factor which might be called *change* (or *event^m*). One use of descriptions, as of classifications, is to become translations by meeting the strict substitution test of adequacy. A more highly developed description of contexts of situation might be used to define the undefined terms of a semantic alphabet by showing their syntactic functions—that is, the situations in which they are used, and the words that come before and after them. Such descriptions could be made entirely within the semantic alphabet; they would be verbally circular, but what they described would be objectively identifiable.

III. TIME IN CONVERSATION

Since conversation is living speech, from which the other kinds of language arise, the adequacy of semantic translation should be tested by substitution for *time* in conversation. The unit of conversation, however, is not the word, but the sentence—the reaction of “first person” (speaker) to “third” (topic of conversation) and “second” (person addressed). Semantic analysis of actual conversation should therefore be the translation of entire sentences rather than the definition of single words; even in the preceding chapter it was frequently necessary to translate more than the single word *time*.

Until conversation can be recorded in all its details without spoiling its naturalness, however, the best conversational material for analysis will be the “conversation” of fiction—preferably fiction that is not too literary. Such fiction has been selected from an issue of *Liberty*. The analysis of fictional conversation, of course, is still an analysis of words, not of reactions; hence the only changes that need to be made in the sentences quoted are those necessary in translating *time* and its derivatives. The wider context of situation, however, even though fictional, should also be described for each of these sentences.

The nineteen words analyzed include not only *time* and *times^m*, as in II., but also "timely," "big-timer," and "some-time." Yet only two of the translations include a word outside the minimum semantic alphabet: (1) the translation "*Half*" of what "*she*" *says^m* is "*in headlines,*"³ for "She talks in headlines half the time"; (2) the translation "*I have*" *had* "*several*" *meetings^m* with "*him,*" for "I have met him several times." The context in which some of the translations are substituted makes it possible for them to be shorter than the originals.

IV. THE TIME OF TENSES

A completely workable method of semantic analysis should apply to all uses of language, from the conversational to the scientific; the most appropriate scientific use of *time* for a linguist to study is the grammarian's use of *time* in discussing tense. The time-relations of Jespersen, which he postulates as being expressed by tenses in verb forms, might be generally described as the *order^m* of *events^m* (*event^m*), and might be specifically classified by translation of tense names: Present as *now*, Past as *before now*, Future as *after now*, and so on.

If, however, this description and these classifications are strictly adequate explanations of "the time of tenses," they should be usable as translations of tense inflections in actual contexts. It is true that such translations are impossible in idiomatic English, where every finite verb is itself a tense form. Yet verbs can occasionally be omitted, and of course the tenseless verbs of Interlingua can always be used as translations. If idiom is disregarded, translations can be made in words from the minimum semantic alphabet: infinitives (without *to*) are used as tenseless verbs, with *now*, *before now*, and *after now*—plus any other adverbials necessary—as indications of the order of events where such indications are needed.

Since modern discussions of tense usage are theoretically supposed to correspond to the spoken language, the contexts

³ The words in the translation that are enclosed in quotation marks are those carried over from the sentences translated (irrespective of presence in or absence from the semantic alphabets), to avoid changes not necessary in translating *time* and *times^m*.

analyzed should be conversational (as in III.); for tenses, a single Sunday comic strip (*The Geography Lesson* by Tut-hill) affords ample material. Surprisingly enough, in the analysis none of the tense names suggested need be added to the tenseless translations; the only adverbials needed are not more than two additions of *then*. Yet the material analyzed contains eighty-three finite verbs, including all the six tenses of the conventional school grammar except the Future Perfect. Of this tense Jespersen gives a few recent examples, although not under the name Future Perfect; analysis of two of these shows that they also can be translated by tenseless verbs (neutral infinitives) without adverbial additions.⁴

Possibly *event*^m (*change*) is the most inclusive single description of *time* that can be applied to tenses; this description, however, applies not so much to tense inflections as to complete verbs—and to verbs only as they are used in portraying events (changes). If tense inflections themselves have a single meaning, that meaning is a zero meaning, since no translation of these inflections is usually necessary.

Tense inflections are only sociologically (idiomatically, syntactically) necessary: they are used to accord with, rather than to express, the order of events; they are also specifically influenced by verbs and adverbials in the immediate context. Quantitative analysis of concrete written verbs (or the corresponding conversational reactions) as they are used in actual contexts of situation, including sociological and psychological background, is therefore to be preferred to treatment of *tense*^m and *time* as concepts.

V. TIME WORDS

Are the "time words"—analyses of *time*—used in II., III., and IV. acceptable as terms of a completely standardized semantic alphabet? This question may be partially answered by two further sets of analyses: (A) of those time words which were taken from the two hundred words of the minimum semantic alphabet, and for which *The Thorndike-Cen-*

⁴ The one occurrence of the word *time* in the comic strip can be translated by words from the minimum semantic alphabet.

*tury Junior Dictionary*⁵ gives definitions that include *time*;⁶ (B) of the few time words which were taken from outside the minimum.⁷

A: (1) All those time words from the minimum that are defined by *time* can be translated by other words from the minimum. Perhaps *day* is an exception to this statement: although its uses as time word may be translated by other words from the minimum, it is needed to translate some of the uses of *when* as a time word. (2) It follows that at least some uses of these time words need not be taken as undefined terms. For example, even *before* can be translated by *after* if wording and arrangement are altered. (3) Naturally, such translations further demonstrate that *time* can be eliminated from the minimum. (4) In the translation of time words, *change*—although occasionally unidiomatic—is even more important than in the translation of *time*.

B: (1) The *measure^m* and *order^m* of *events^M* (*event^m*) already have adequate translations in *number of change as before and after* (or *as one after another*). (2) The third-person-singular inflection of *says^m* and the plural inflection of *meetings^M* are, like tense forms, only sociologically necessary; such inflections would not be used, for example, in a semantic alphabet composed of Interlingua words. (3) Even *meeting^m* would not need to be used, as a substitute for *meetings^M*, if English idiom permitted free modification of verbs by numerals and numeral-equivalents, instead of requiring usually an adverbial phrase including *time* or *times^m*.

Analyses A and B, like the comments in I. and the analyses in II., III., and IV., indicate that one satisfactory way to begin making a standardized semantic alphabet is to analyze a series of words from the tentative minimum semantic alphabet, the words in which the analyses are written being also

⁵ In this dictionary the selection of vocabulary is based on word counts, and the definitions are when possible written in words simpler and commoner than the words defined.

⁶ If the *time* in the definition of the time words can be analyzed by other words from the semantic alphabets, these other words might be used to replace the time words themselves as translations of *time*.

⁷ The one or two words outside the minimum that are used in translating tense forms are not time words, but merely the neutral infinitives corresponding to those tense forms.

taken from the minimum. The only thorough analyses of this sort would be translations of words in context, words outside the minimum being analyzed as parts of these contexts. Analysis of the entire minimum would require the use of other than English terms; but even in English the different meanings of a word that is idiomatically irreducible may at least be distinguished by classifying numerals: *after.1*, *after.2*, etc.

If other words could be analyzed with as restricted an apparatus as *time* and time words, not more than two hundred irreducible terms—provided with classifying numerals where necessary, and supplemented by mathematical symbols and other devices simulating direct representation—would be needed in a completely standardized semantic alphabet; one of the two hundred would doubtless correspond to *event^m* or *change*.

VI. CONCLUSIONS

The main results of the analysis are twofold: (1) the meanings found for (a) *time*, (b) derivatives—including the plural—of *time*, (c) tenses, (d) certain “time words” used as translations of *time*; (2) the contributions made to the theory of semantic analysis, especially (a) the five criteria for standardizing semantic analyses, and (b) the three types of semantic analysis distinguished. Result (2) is the more important. In fact, the purpose of the analyses under (1) is to show concretely that meanings of even those words (and derivative modifications) which are not picturable can be expressed objectively; for a translation may be called the meaning, in directly examinable form, of what is translated.

Analysis of even twenty-six occurrences of *time* and its derivatives shows decided divergence in meaning; the furthest that can be said is that some such word as *change* is the most helpful in analysis. The meanings (translations) of tense inflections are additions made to analyses of finite verbs when the analyses are the infinitives of the verbs, used like Interlingua tenseless verbs; analysis of eighty-five verbs requires not more than two such additions. That linguists should avoid using *time* and *tense^m* as fundamental terms is therefore indicated by both the various meanings of the single word *time*, and the single (zero) meaning of the various tenses.

The following list gives the five criteria for standardizing semantic analyses, with the methods developed to meet these criteria: (1) **Noncircularity**—using semantic alphabets of undefined terms; (2) **Facility**—making these semantic alphabets from the commonest words; (3) **Parsimony**—reducing the number of undefined terms, eliminating *time* and other words by analysis; (4) **Adequacy**—substituting analysis for analyzed words in/and context; (5) **Uniformity**—having undefined terms consistent in meaning.

Criteria (1), (2), and (3) were discussed in I.; (4) in II.; (5) in V. The analyses in II., III., IV., and V. meet the first four criteria. Uniformity may be approached by mathematical symbols and other devices simulating direct representation, by classifying numerals for different syntactic functions of idiomatically irreducible terms, and possibly by Interlingua flexionless words; Uniformity is aided by Parsimony, which leads to reduction of the number of terms with inconsistent meanings and hence makes inconsistency easier to eliminate.

The three types of semantic analysis (discussed in II. and further compared in IV.) are **translation**, **classification**, and **description**. Although only translations meet the substitution test for Adequacy, all three types may be written in the semantic alphabets. Indeed, a systematic series of analyses should be written in words from some semantic alphabet, with full use of classifying numerals and other approaches to Uniformity. Each analysis in the series would be composed of the translation of some linguistic context as a whole, with footnotes giving descriptions of the psychological and sociological background. Even on a less elaborate scale, however, the objectivity of translation into a semantic alphabet can help scientific investigators in many fields to interpret understandably the words of others and to avoid controversies over their own meanings.

SUPPLEMENTS

VII. THE COMMONEST ENGLISH WORDS

The semantic alphabets discussed in I. are based on statistically determined word lists:

- 1915 Leonard P. Ayres, *A Measuring Scale for Ability in Spelling*. New York: Russell Sage Foundation.
- 1923 Godfrey Dewey, *Relative Frequency of English Speech Sounds* (Harvard Studies in Education, Vol. IV). Cambridge: Harvard University Press.
- 1925 Ernest Horn, "The Commonest Words in the Spoken Vocabulary of Children Up to and Including Six Years of Age" (*The Twenty-fourth Yearbook of the National Society for the Study of Education. Part I, Report of the National Committee on Reading*). Bloomington (Illinois): Public School Publishing Company.
- 1926 Ernest Horn, *A Basic Writing Vocabulary: 10,000 Words Most Commonly Used in Writing* (University of Iowa Monographs in Education). Iowa City: College of Education, University of Iowa.
- 1930 Norman R. French, Charles W. Carter, Jr., and Walter Koenig, Jr., *The Words and Sounds of Telephone Conversations* (Bell Telephone System Technical Publications, Monograph B-491; reprinted from *The Bell System Technical Journal*, IX [April], 290-324). New York: Bell Telephone Laboratories.
- 1931 Edward L. Thorndike, *A Teacher's Word Book of the Twenty Thousand Words found most frequently and widely in general reading for children and young people*. New York: Bureau of Publications, Teachers College, Columbia University.⁹

As the first 500 of the 1925 list, which does not show rank, are used the 470 words found also in a 1934 list¹⁰ as having translations among the first 1000 in French, German, and Spanish. The 470 include *he* and *say*, which are only

⁸ Simplified spelling.

⁹ *The Teacher's Word Book*, 1921, of only ten thousand words, gives more specific credit-numbers.

¹⁰ Helen S. Eaton, *Comparative Frequency List: A study based on the first thousand words in English, French, German, and Spanish Frequency Lists* (Reprinted from *Experiments and Studies in Modern Language Teaching*, compiled for the Committee on Modern Language Teaching by Algernon Coleman. Chicago: The University of Chicago Press.) New York: International Auxiliary Language Association.

partially identical in the two lists.¹¹ There are 198 words common to this 470 and the first 500 of the other lists. The minimum semantic alphabet adds *one* and *if*; these are not in the 1930 list (*one* because all numbers are excluded), but are among both the 470 of the 1925 list and the first fifty of the other lists. On similar grounds *he* and *say* would be included in the 200 even without use of partial identities.¹²

Beyond the two hundred words of the minimum semantic alphabet, a free use of pictures, standard symbols, and capitalized words has already been suggested. Any uncapitalized words from the medium and maximum may also be added if the additions are absolutely necessary; the requirement that they be absolutely necessary calls for careful consideration of all additions, and for all possible efforts to find translations of them.

In nonidiomatic translations, as in analysis of tense, thirty or more words might be added without increasing the total beyond two hundred; for there are thirty or more words in the minimum which would be unnecessary in nonidiomatic translations—words which would conventionally be called inflected forms, derivatives, and compounds of other words in the minimum. In idiomatic translations, on the other hand, many other inflected forms, derivatives, and compounds of the words in the minimum must be added; the source should be the 1926 list.

¹¹ Thus, *he* and *say* are in the 1934 list; *he's* and *says* in the 1925 list; *him*, *his*, and *said* in both. The 470 include various other words (not common enough to appear in the minimum semantic alphabet) because of such partial identities.

¹² The validity of the minimum as a whole is further shown by comparison with Italian word lists:

1933 Tacie Mary Knease, *An Italian Word List from Literary Sources*. Toronto: The University of Toronto Press.

1935 Laurence Herve Skinner, "A Comparative Study of the Vocabularies of Forty-Five Italian Textbooks." *The Modern Language Journal*, XX (November), 67-84.

The only three minimum words (*number*, *second*, *thank*) without translations among the first 1,000 of the 1933 list have translations among the first 500 of the 1935 list.

a	could	him	much	same	to
about	day	his	must	say	to-day
after	did	home	my	second	too
again	do	house	name	see	up
all	does	how	near	send	us
along	done	I	need	she	use
always	down	if	never	should	very
am	even	in	new	show	want
an	ever	into	next	small	was
and	every	is	night	so	way
another	far	it	no	some	we
any	feel	just	not	something	well
are	find	keep	now	soon	were
as	first	know	number	still	what
ask	for	last	of	sure	when
at	from	let	off	take	where
away	full	letter	old	tell	which
back	get	like	on	than	who
be	give	line	one	thank	whole
because	glad	little	only	that	why
been	go	long	open	the	will
before	good	look	or	their	wish
believe	great	make	other	them	with
best	had	man	our	then	work
better	hand	many	out	there	would
big	hard	matter	over	these	write
but	has	may	part	they	year
by	have	me	pay	thing	yet
call	he	might	people	think	you
can	hear	mind	place	this	your
care	help	money	put	those	
change	her	more	read	though	
come	here	morning	right	through	
company	high	most	room	time	

VIII. AUTHORS CITED

The only authors named here are those to whom specific reference is made at some point in the body or footnotes of the revised dissertation. Dictionary editors are included, but not translators.

Abbot	Davis	Koenig	Palmer	Strong
Aiken	Deutschbein	Korzybski	Pareto	Sturt
de Angulo	Dewey, G.	Krapp	Parker	Sturtevant
Antoni	Dewey, J.	Kruisinga	Peano	Swadesh
Aristotle	Dolch	de Laguna	Piaget	Sweet
Ayres	Eaton	Lalande	Pillsbury	Swenson
Baldwin	Einstein	Langford	Postgate	Thompson
Bally	Eisler	Leibniz	Poutsma	Thorburn
Baugh	Erdmann	Lewis, C.I.	Richards	Thorndike
Bentley	Fadiman	Lewis, W.	Riedlinger	Tuthill
Bergson	Freeland	Liddell	Robb	Tysell
Bissell	French	Logeman	Robertson	Ushenko
Blake	Fries	Luebke	Robinson, D.S.	Vander Beke
Bloomfield	Gardiner	Mach	Robinson, J.H.	Vendryès
Blount	Graff	Maetznér	Routh	Walpole
Bolling	Greenough	Malinowski	Russell	Walter
Bradley	Gunn	Markey	Santayana	Watson
Bréal	Henderson	Mauthner	Sapir	Weiss
Bridgman	Henmon	Meador	de Saussure	Welby
Broad	Homans	Mill	Schmidt	Wells
Brooks	Horn	Morgan	Schreuder	Wendt
Brunot	James	Morris, A.V.	Scott	West, A. S.
Brusendorff	Jespersen	(Mrs. D.H.)	Searles	West, M.
Buchanan	Johnson	Morris, E. P.	Séchéhaye	Wheeler
Burnham	Kaeding	Murray	Sellers	Wheelwright
Carhart	Kant	Neilson	Shaw	White
Carnoy	Kantor	Nordmann	Sheffer	Whitehead
Carr	Kaulfers	Noreen	Sheffield	Willis
Carter	Kennedy	Northup	Skinner	Wilson
Coleman	Kent	Ockham	Smith	Wisdom
Croce	Keyser	(Occam)	Smuts	Wittgenstein
Curme	Kittredge	Oertel	Sonnenschein	Wolfe
Curtis	Knease	Ogden	Sperber	Wundt
Dahl	Knott	Owen	Stern	Zamenhof

